

Soils within the post-2015 sustainable development agenda

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European Commission
DG JRC.H.05



RIO 2012

United Nations
Conference on
Sustainable Development

The Future we want!

The Road to 2015

March – Aug 2014:
OWG shifts to
recommending
new goals, goals,
indicators

Sept 2014:
OWG submits
report to UN
GA

End of 2014:
UNSG synthesis
report of all
inputs to Post-
2015 process

September
2014-2015:
Negotiations
of Post-2015
Agenda.

Sept 2015 Summit:
Adoption of Post-
2015 Development
Agenda



TRANSFORMING OUR WORLD:
THE 2030 AGENDA FOR SUSTAINABLE
DEVELOPMENT

TRANSFORMING OUR WORLD: THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

Sustainable Development Goals

Goal 1. End poverty in all its forms everywhere

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3. Ensure healthy lives and promote well-being for all at all ages

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 5. Achieve gender equality and empower all women and girls

Goal 6. Ensure availability and sustainable management of water and sanitation for all

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Goal 10. Reduce inequality within and among countries

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12. Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts*

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.



1 NO POVERTY
End poverty in all its forms everywhere



2 ZERO HUNGER
End hunger, achieve food security and improved nutrition and promote sustainable agriculture



3 GOOD HEALTH AND WELL-BEING
Ensure healthy lives and promote well-being for all at all ages



4 QUALITY EDUCATION
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all



5 GENDER EQUALITY
Achieve gender equality and empower all women and girls



6 CLEAN WATER AND SANITATION
Ensure availability and sustainable management of water and sanitation for all



7 AFFORDABLE AND CLEAN ENERGY
Ensure access to affordable, reliable, sustainable and modern energy for all



8 DECENT WORK AND ECONOMIC GROWTH
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation



10 REDUCED INEQUALITIES
Reduce inequality within and among countries



11 SUSTAINABLE CITIES AND COMMUNITIES
Make cities and human settlements inclusive, safe, resilient and sustainable



12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Ensure sustainable consumption and production patterns



13 CLIMATE ACTION
Take urgent action to combat climate change and its impacts*



14 LIFE BELOW WATER
Conserve and sustainably use the oceans, seas and marine resources for sustainable development



15 LIFE ON LAND
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss



16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels



17 PARTNERSHIPS FOR THE GOALS
Strengthen the means of implementation and revitalize the global partnership for sustainable development

SDG 1:
End poverty

SDG 2:
Achieve
food security

SDG 3:
Healthy lives
for all

SDG 5:
Gender
equality

SDG 6:
Water for all

SDG 7:
Energy for all

SDG 11:
Cities safe
and sustainable

SDG 13:
Combat
climate change

SDG 15:
Protect terrestrial
ecosystems



European
Commission

Actions to be taken

Access and secure rights
to productive land

Changes in land use and
cover, resulting in
sustainable use

Promoting sustainable
agriculture and food
systems

Ensuring livelihoods for
poor and vulnerable
populations

Halting deforestation,
land and soil
degradation, and
biodiversity loss

Increased production and
consumption of biomass
for food, feed, fibre, and
fuel



Basic soil biodiversity related ecosystem services that must be protected

Carbon cycle regulation
and contribution to
climate change
mitigation

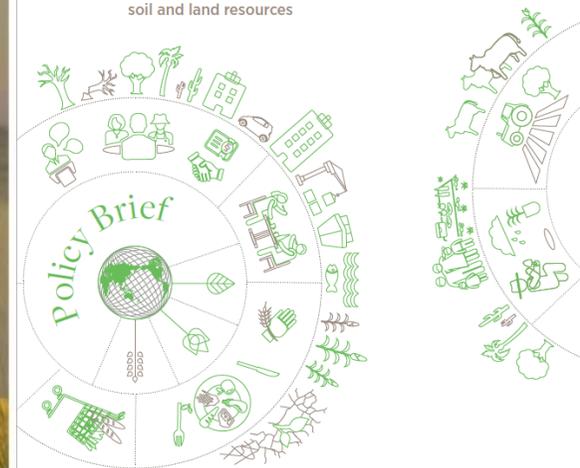
Regulation of
water supply and
quality

Biological
population control
and habitat
support

Nutrient provision
and cycling for
crop/forest growth
and other
ecosystems

IASS
POTSDAM
Global Soil Forum
Institute for Advanced Sustainability Studies e.V.

Grounding the Post-2015 Development Agenda:
Options for the protection of our precious
soil and land resources



SDGs explicitly mentioning soil:

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Target 15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world

Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and **soil quality**.

*Proposed Indicator : **Percentage of agricultural area under sustainable agricultural practices.***

Target 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and **soil pollution and contamination**.

*Proposed Indicator: **Population in urban areas exposed to outdoor air pollution levels above WHO guideline values***

Target 15.3 By 2030, combat desertification, restore degraded land and **soil**, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world

*Proposed Indicator : **Percentage of land that is degraded over total land area.***

Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

→ Proposed Indicator: **Soil Quality**

Rationale:

The indicator is specifically linked to this target and explicitly mentioned in the target description. There is an extensive scientific and technical literature available documenting the development of a soil quality indicator. The indicator is currently operational within the OECD as one of the two agro-environmental indicators related to soils: soil erosion and soil quality. OECD countries are already regularly reporting on soil quality. See for example the regular reporting by the EU through EUROSTAT at http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_soil_quality



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Agri-environmental indicator - soil quality

Data from July 2012. Most recent data: [Further information](#), [Main tables and Database](#). Planned update: October 2016.

This article provides a fact sheet of the [European Union \(EU\) agri-environmental indicator](#) soil quality. It consists of an overview of recent data, complemented by all information on [definitions](#), [measurement methods](#) and [context](#) needed to interpret them correctly. The soil quality article is part of a [set of similar fact sheets](#) providing a complete picture of the state of the agri-environmental indicators in the EU.

The indicator provides an account of the ability of soil to provide agri-environmental services through its capacities to perform its functions and respond to external influences.

In the agri-environmental context, soil quality describes:

- the capacity of soil to [biomass](#) production;
- the input-need to attain optimal productivity;
- the soil-response to climatic variability;
- carbon storage, filtering, buffering capacity.

Main indicator

- [Agri-environmental soil quality index](#)

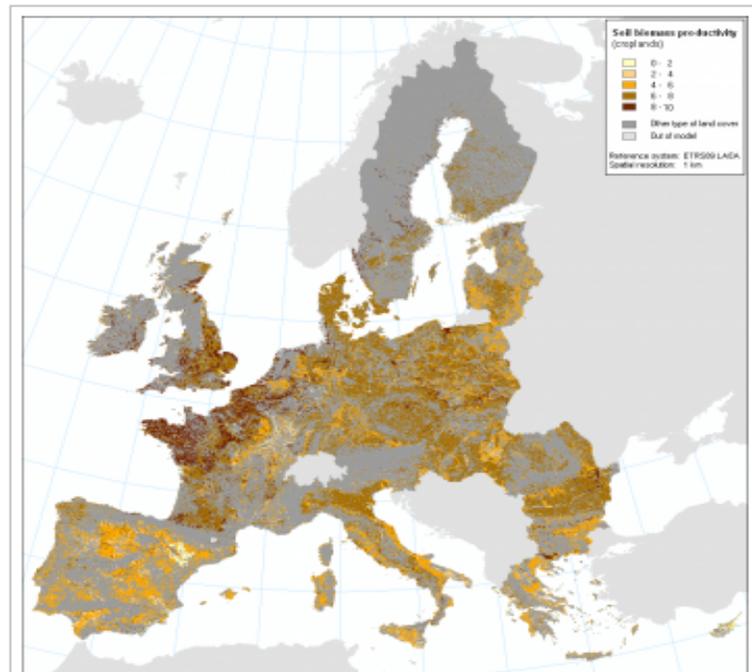
Supporting indicators

- Sub-indicator 1: [Productivity index](#)
- Sub-indicator 2: [Fertiliser](#) response rate
- Sub-indicator 3: [Production stability index](#)
- Sub-indicator 4: [Soil environmental services index](#)

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 - 1.2.1 [Supporting indicator 1 - Soil productivity index](#)



Map 1: Soil biomass productivity of croplands in the EU (expressed in relative terms with indices without measurement units), 2006, EU-27

Source: Joint Research Centre, European Commission

Target 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

➔ Proposed Indicator: **Progress in management of contaminated sites**

Rationale:

The number of contaminated sites and progress made in their management and remediation is a key factor for achieving the proposed goal and specific target. Many countries in the world already have regular reporting systems on their contaminated sites. For example in Europe, regular reporting is managed by the European Environment Agency (see <http://www.eea.europa.eu/data-and-maps/indicators/progress-in-management-of-contaminated-sites-3/assessment>).



J R C R E F E R E N C E R E P O R T S



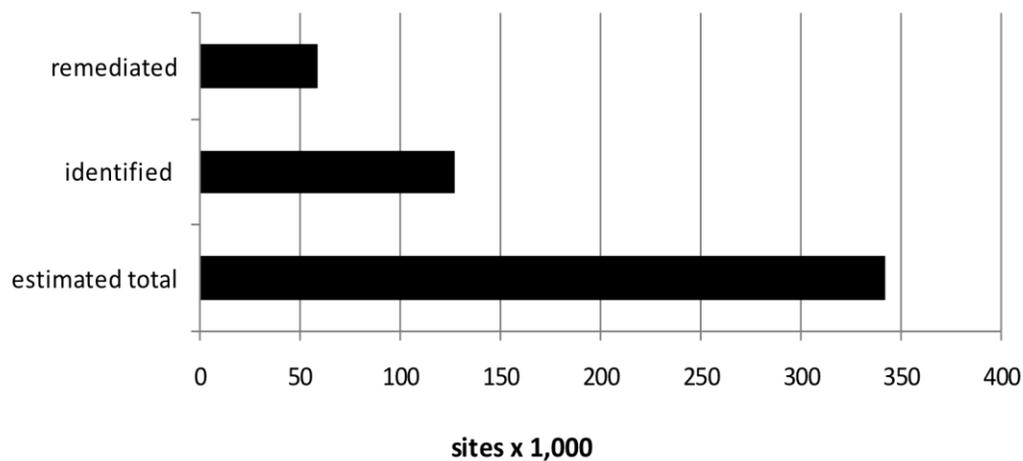
Progress in the management of Contaminated Sites in Europe

Marc van Liedekerke, Gundula Prokop,
Sabine Rabi-Berger, Mark Kibblewhite,
Geertui Louwagie

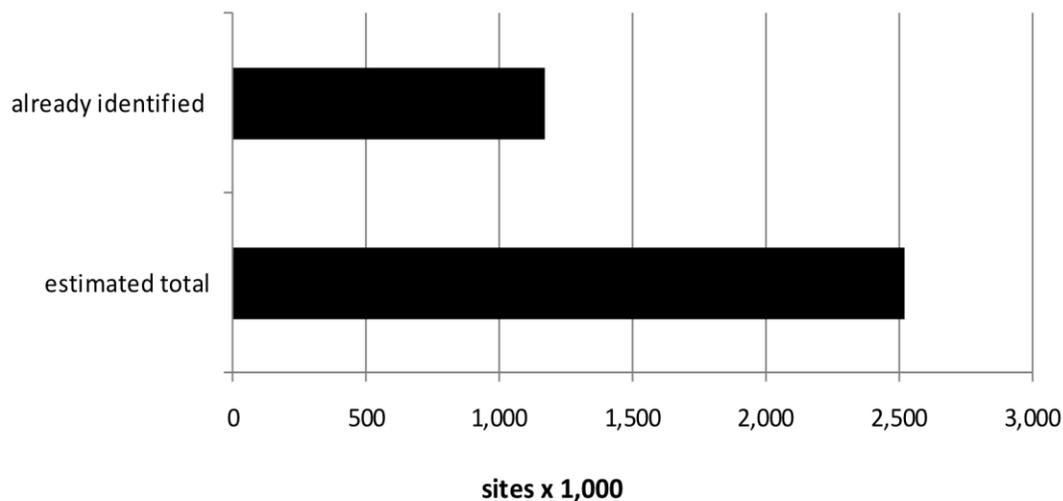
2014

Report EUR 26376 EN

Contaminated Sites



Potentially Contaminated Sites



Target 15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world

1. Proposed Indicator 1: **Trends in land/soil degradation**
2. Proposed Indicator 2: **Area of land/soils under sustainable management**

Rationale:

Achieving a land degradation neutral world requires compensating on-going land degradation trends with equivalent land restoration activities. Soils are an integral component of land and the target explicitly call upon soil restoration activities. Sustainable Soil Management (SSM), as already recommended by the FAO Committee on Agriculture (COAG), should be a cornerstone of sustainable development. Therefore it should be explicitly included in the proposed indicators and further developed by the proposed working group on SSM to be established by FAO.

Voluntary Guidelines for Sustainable Soil Management (SSM)

- Definition of SSM
- Soil functions
 - Biomass production, including in agriculture and forestry;
 - Storing, filtering and transforming nutrients, substances and water;
 - Biodiversity pool, such as habitats, species and genes;
 - Physical and cultural environment for humans and human activities;
 - Source of raw materials;
 - Acting as carbon pool;
 - Archive of geological and archeological heritage.
- Threats to soil functions
 - Erosion, sealing, contamination, compaction, salinization, acidification, etc....
- Catalogue of good practices
- Case studies and demonstrations

Indicator 15.3.1: Trends in land degradation

Tier 1: Trends in land use/cover

Tier 2a: Trends in land productivity

Tier 2b: Trends in soil organic carbon stocks

- **Tier 1: Trends in Land Use/Cover.** This indicator is expressed in ha or km² or proportion of total land cover type and measure transitions from, *inter alia*, (1) natural and semi-natural land cover types (e.g., forest, shrubs, grasslands, sparsely vegetated areas) to agricultural land and artificial surfaces (e.g., urban, infrastructure, recreation), (2) agricultural land to artificial surfaces, and (3) agricultural land and artificial surfaces to natural and semi-natural land cover type.
- **Tier 2a: Trends in Land Productivity** (disaggregated by land use/cover type). These trends are calculated from long-term time series of remotely-sensed data on net primary productivity (NPP) at 1 km² spatial resolution and at 10 day intervals. An overview on the state-of-the-art methodologies is given by Yengoh et. al., 2014; Cherlet et al. 2014; Quang Bao Le et al., 2014.
- **Tier 2b: Trends in Soil Organic Carbon (SOC) Stocks** (disaggregated by land use/cover type). Baseline data on SOC are derived from version 1.1 of the Harmonized World Soil Database (HWSD) (FAO/IIASA/ISRIC/ISS- CAS/JRC 2009) and are expressed in tons per ha to a depth of 1m at a nominal spatial resolution of 1km (Scharlemann et al. 2009). The FAO's Global Soil Partnership (GSP) is currently elaborating options for global measurements that would allow for the establishment of spatially distributed trends in SOC, estimated as a stock and expressed as mass (g C per ha) or content (% or g C/100 g of soil) for a reference depth.



Climate Change

The relevance of global soil organic carbon



When policy makers use scientific findings



~800 -2.9 (4‰)
~800 +4.3 (5‰)
In top 0-30 cm

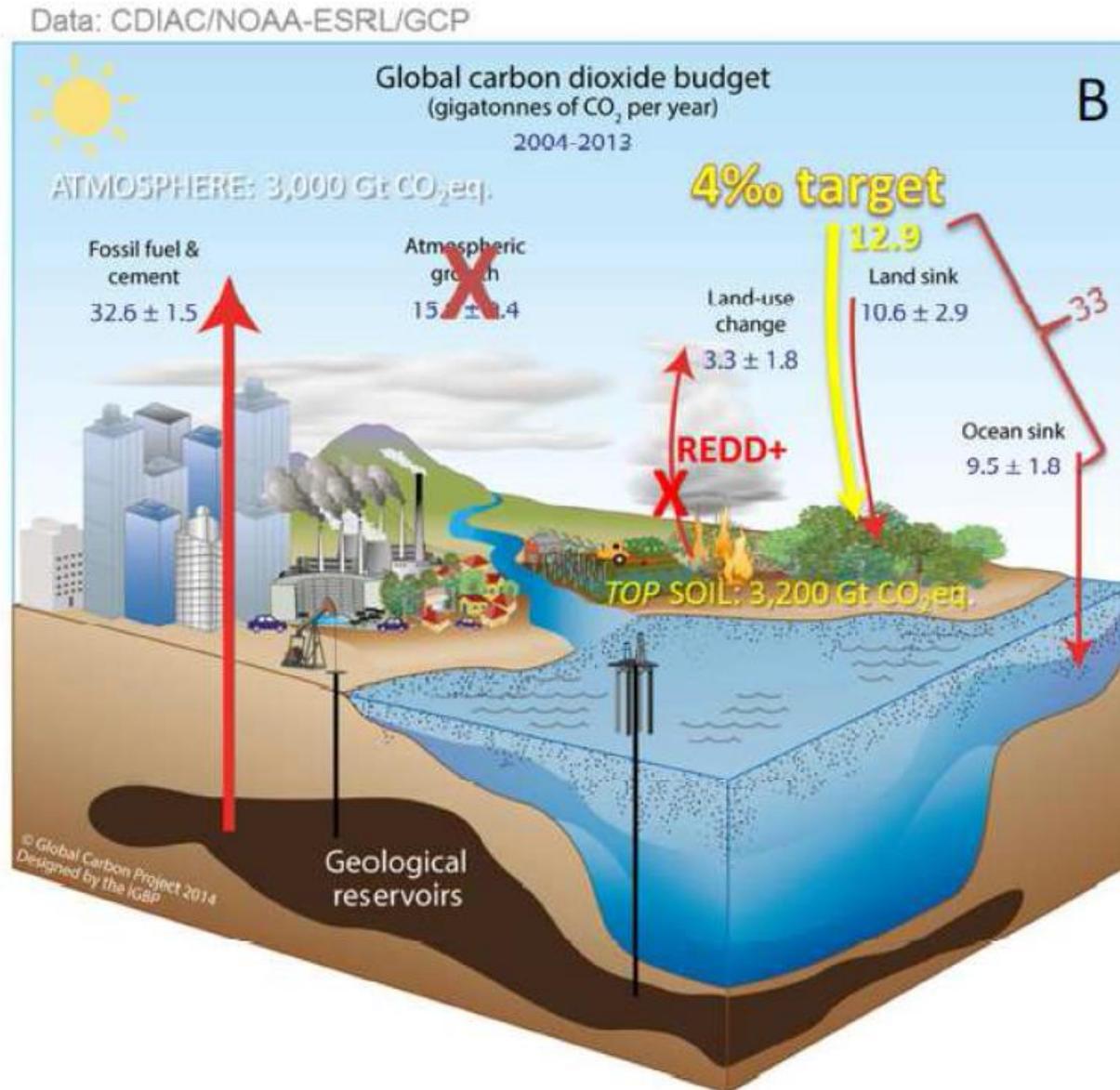
A variation of – 4‰ to + 5‰ of this stock corresponds to
– 110 to + 130 kg C /ha
or – 400 à + 475 kg CO₂ /ha

During the CSA conference in March, the French Minister of Agriculture, Food and Forestry, Stéphane Le Foll announced public subsidies will be available for an international research project on the restoration of degraded soils and soil carbon sequestration



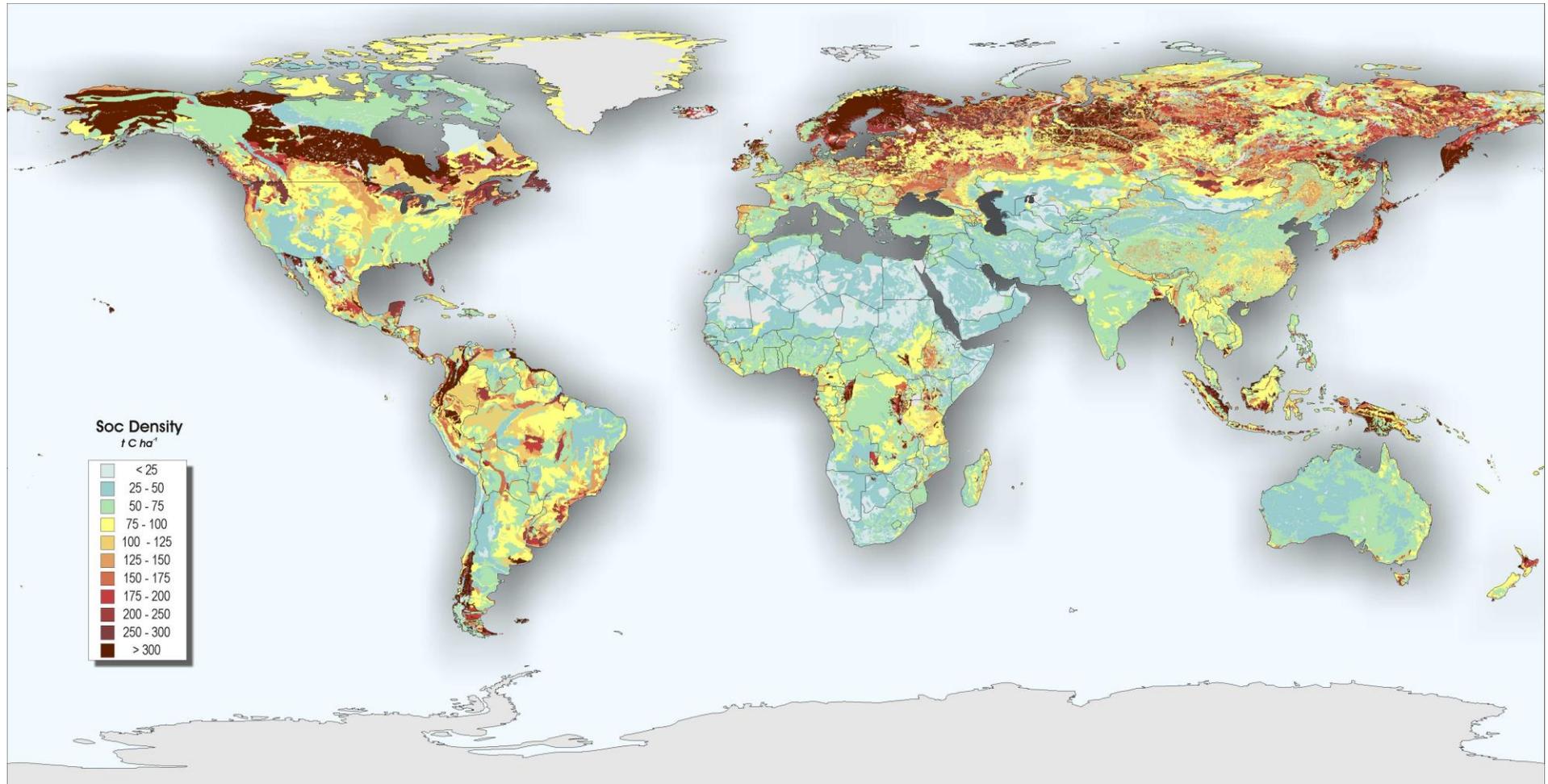
He announced the establishment of an international research programme, the "**4 per 1000**", which aims to develop agricultural research to improve organic matter stocks in soil by four parts per 1000 per year.

The 4 per mil target for soil carbon sequestration

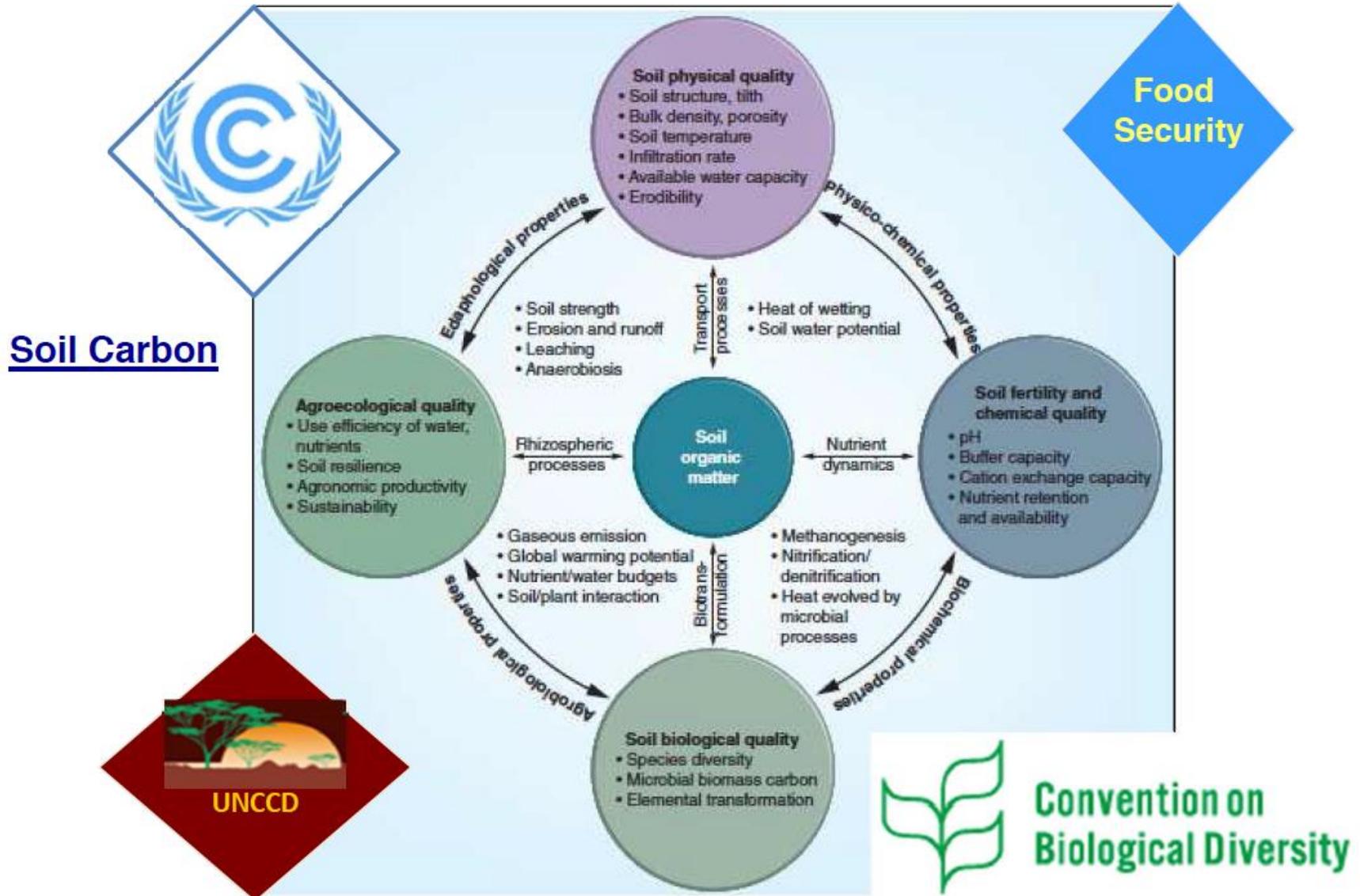


(revisiting Balesdent & Arrouays, 1995 for France)

Global Soil Organic Carbon



Soil organic matter: multiple benefits



REJOIGNEZ L'INITIATIVE 4 POUR 1 000

Les sols pour la sécurité alimentaire et le climat

En s'appuyant sur une documentation scientifique solide et des actions concrètes sur le terrain, l'initiative « 4 pour 1 000 » vise à montrer que **sécurité alimentaire et lutte contre les dérèglements climatiques sont complémentaires** et à faire en sorte que l'agriculture apporte des solutions. Cette initiative consiste en une coalition d'acteurs volontaires dans le cadre du Plan d'action Lima Paris (LPAA) soutenue par un programme de recherche ambitieux.



> CALENDRIER LES ÉTAPES À NE PAS MANQUER

- ➔ 16 septembre 2015 Conférence internationale sur *L'agriculture et les sols agricoles face aux défis de la sécurité alimentaire et du changement climatique : politiques publiques et pratiques* à l'OCDE
- ➔ 12-15 octobre 2015 Comité de la sécurité alimentaire mondiale à Rome – FAO
- ➔ 12-23 octobre 2015 COP12 de la Convention des Nations unies pour la lutte contre la désertification à Ankara
- ➔ 1^{er} décembre 2015 COP21 à Paris : lancement officiel de l'initiative par la signature d'une déclaration commune à l'ensemble des acteurs.

Chiffres clés

24% des sols mondiaux sont dégradés à des degrés divers, dont près de la moitié des sols agricoles [source : Bai et al., 2013]

1 500 milliards de tonnes de carbone dans la matière organique des sols mondiaux, plus de deux fois le carbone du CO₂ atmosphérique [source : GIEC, 2013]

1,2 milliards de tonnes de carbone par an, pourraient être stockés dans les sols agricoles (cultures et prairies) soit un taux annuel de stockage d'environ **4 pour 1 000** par rapport à l'horizon de surface du sol [source : GIEC, 2014].

24/40 millions de tonnes de grain supplémentaires pourraient être produits chaque année en Afrique, Asie et Amérique du Sud en stockant une tonne de matière organique par hectare [Lal, 2006]

1,2 milliards US \$ de perte économique en grains liée à la dégradation des sols [FAO, 2006]



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POUR LE CLIMAT**

cop21.gouv.fr #COP21

Thank you for your interest!



2015
International
Year of Soils



itps
INTERGOVERNMENTAL TECHNICAL
PANEL ON SOILS

<http://eusoils.jrc.ec.europa.eu/>